

ORIGINAL

Before the
Federal Communications Commission
Washington, D.C.

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
)
Revision of the Commission's Rules)
To Ensure Compatibility with)
Enhanced 911 Emergency Calling Systems)

CC Docket No. 94-102

To: Wireless Telecommunications Bureau

PETITION FOR WAIVER OF SECTION 20.18(g)

Western Wireless Corporation

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August 31, 2001

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SUMMARY

Western Wireless Corporation (“Western”) hereby requests a waiver of Section 20.18(g) of the Commission’s rules to permit Western to deploy a handset-based solution -- Assisted Global Positioning System (“AGPS”) -- for providing Phase II location information. Although AGPS is capable of supplying location information that satisfies the Commission’s accuracy requirements, a waiver is necessary because location-enabled handsets cannot be deployed by Western within the time periods set forth in Section 20.18(g). Because Western is a rural carrier, network-based technologies will not satisfy the Commission’s requirements in its markets. Thus, handset-based solutions are Western’s only option.

The waiver request is based upon the commercial availability of Phase II handset-based location technology and Western’s ability to fully implement this technology into its rural markets. Because Western does not obtain new handset models until 90 days after larger carriers, it cannot meet the same deployment schedule as larger carriers such as Verizon. Accordingly, Western seeks approval to meet the 50 and 100 percent benchmarks within 90 days of the schedule proposed by Verizon -- June 2003 and April 2004 respectively. With respect to the conversion of legacy handsets, Western will commit to the conversion of 95 percent of these handsets by year-end 2005.

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Western Wireless Corporation ("Western" or "the Company"), on behalf of its subsidiaries¹ and pursuant to Sections 1.3 and 1.925 of the Commission's rules,² hereby requests a waiver of the enhanced 911 ("E911") Phase II implementation schedule. Specifically, Western seeks a waiver that would permit it to deploy a handset-based solution using Assisted Global Positioning System/Advanced Forward Link Trilateration ("AGPS/AFLT") for providing Phase II location information. Western has concluded that this is the best possible solution to achieve compliance with the Commission's Phase II rules. Moreover, only handset-based solutions can achieve compliance with the FCC's accuracy requirements in Western's rural markets. A waiver of the Phase II E911 implementation schedule is necessary, however, because a handset-based solution cannot be deployed within the time periods set forth in Section 20.18(g).³ The waiver is both justified and in the public interest because only a limited number of Public Service Answering Points ("PSAPs") have requested Phase II service from Western and the Company is taking the necessary steps to immediately implement E911 service and

¹ The Western Wireless subsidiaries covered by this waiver request are listed in Attachment A.

² 47 C.F.R. §§ 1.3, 1.925.

³ By this filing, Western also hereby notifies the Commission, pursuant to Section 20.18(i) of the rules, of its decision to deploy a handset-based Phase II solution.

become compliant upon commercial availability of Phase II handset technology as soon as economically practical.

I. WESTERN IS A RURAL CELLULAR SERVICE PROVIDER FACING UNIQUE CHALLENGES IN DEPLOYING A PHASE II E911 SOLUTION

A. Western Is Uniquely A Rural Cellular Service Provider

Western operates cellular systems in 19 western states under the Cellular One® brand name, serving over 1,000,000 subscribers in 18 Metropolitan Service Areas (“MSAs”) and 83 Rural Service Areas (“RSAs”). Figure 1 depicts the markets served by Western.

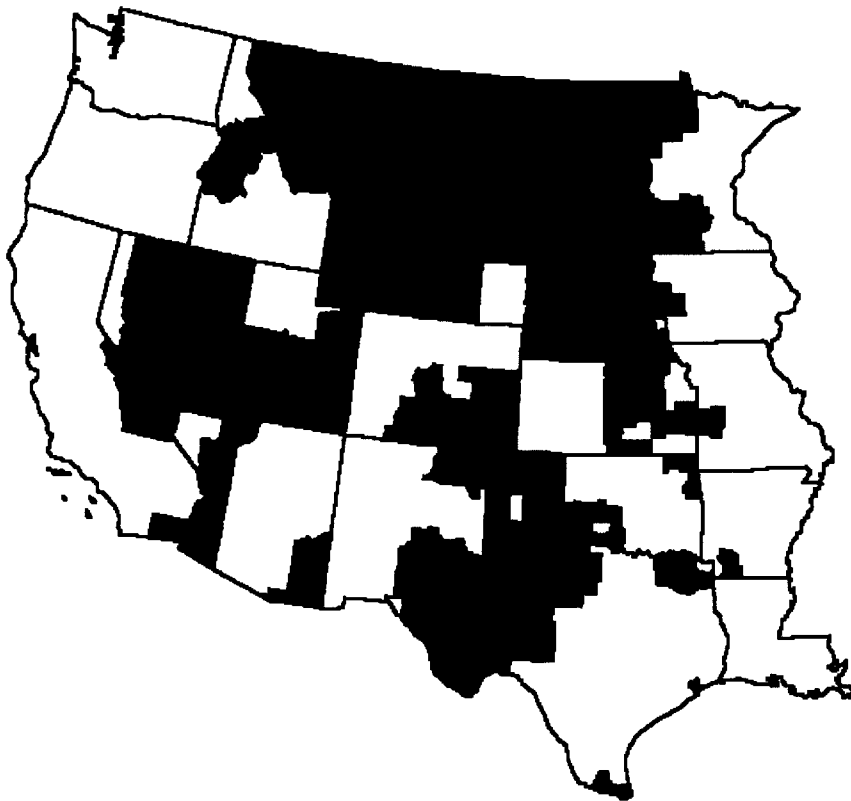


Figure 1. Cellular Markets Served by Western Wireless

The cellular markets served by Western cover approximately 25 percent of the geography of the continental United States, making the Company the second largest wireless carrier in terms of geography served. However, in terms of population served, Western's markets cover only approximately nine million people, making the Company the 22nd largest wireless carrier. The vast majority of the company's service area has a population density of less than 2.9 people per square mile.

In the low population density areas, Western makes use of many elevated or mountain top sites in order to maximize the coverage of each site. These sites have little, if any, overlap and are used to cover large geographic areas in less populated areas. Economic considerations force the deployment of these very large coverage sites in order to maximize the number of users per site located in very sparsely populated areas. While these large cell sites serve nearly 80% of Western's coverage area, the typical usage per site is one quarter of a site in a more urban environment, such as Billings, Montana or Lubbock, Texas.

In some cases, hand-off is not possible between rural cell sites because the coverage of cell sites may not overlap, especially when a call is placed from a small handheld phone (e.g., a non-3-watt car or bag phone). Figure 2 below shows the distribution of cell site sizes in Western's network. It is common for a rural site to have less than 20 channels. It is not cost-effective to add additional sites in rural areas where call volumes (and channel counts) do not justify the investment.

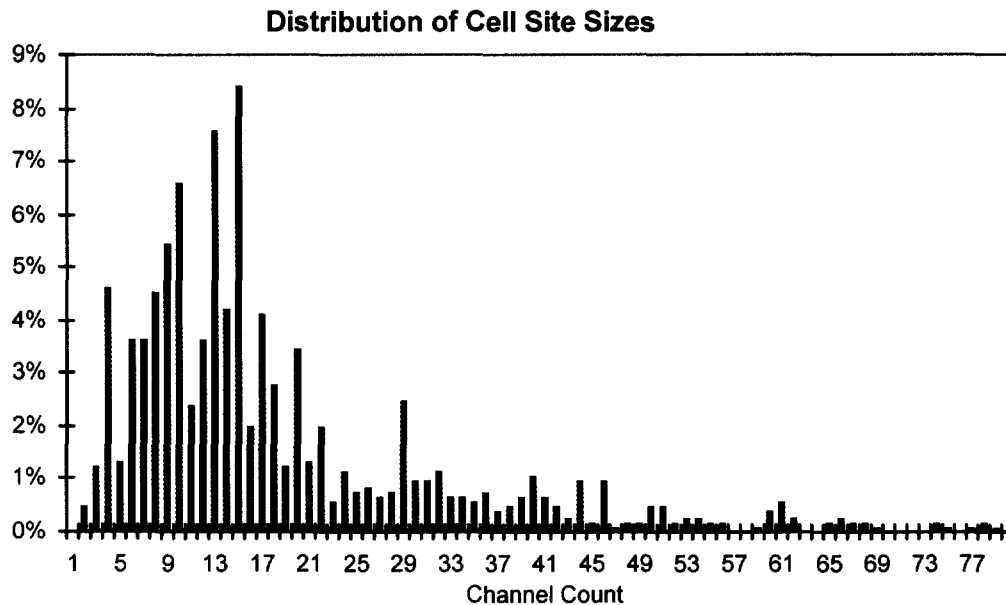


Figure 2. Distribution of cell site capacity.

Significantly, the vast majority of Western's customers are served by a single cell site, which makes many Phase II solutions unavailable to Western. In sum, the rural nature of Western's service area presents significant challenges to providing cellular service throughout its markets and deploying a Phase II E911 solution.

B. Western Is Working With PSAPs To Deploy E911 Service Within Its Service Area

Although Western has deployed Phase I service in many areas and is currently working to implement Phase I E911 service elsewhere, it has received very few requests for Phase II E911 service. Of the 558 counties served by Western, only 39 counties (approximately 7%) have requested Phase II service. The Company has deployed or is currently in the process of deploying Phase I service in all areas requested by PSAPs and

is committed to providing E911 service in the most expeditious and efficient manner possible.

PSAPs are concerned about the cost of supporting E911 service, which explains why so few PSAPs have requested E911 service in the rural areas served by Western. Even though many of the states in which Western provides service have E911 cost-recovery mechanisms in place for both the carrier and the PSAP, there has been a sensitivity to the costs of deploying E911 service. This is especially true for Phase II E911 service. As the technology becomes more mature and less costly, it is anticipated that the Company will receive additional PSAP requests for E911 service.

II. PHASE II E911 OPTIONS

Western has evaluated various solutions for complying with the Commission's rules governing Phase II E911 deployment. The solutions fall into two categories: network-based solutions that incorporate location technology into the network and handset-based solutions that incorporate location technology largely within customer handsets. A network-based solution requires the installation of additional antennas and receiving equipment at each cell site, dedicated backhaul to a centralized location, and a location server. In a network-based solution, the location server calculates a mobile customer's location based upon the time of arrival and/or the angle of arrival of a mobile customer's signal at the various receivers (e.g., cell sites) within the coverage area. This technology typically requires three different cell sites or sectors capable of receiving the mobile customer's signal to get an accurate location. In a handset-based solution, a centralized location server is also used, but, instead of requiring multiple cell sites to

determine the location of a mobile customer, the location on the mobile customer is determined by a GPS reading from a receiver located in the handset.⁴

III. WESTERN HAS EVALUATED PHASE II E911 SOLUTIONS FOR ITS RURAL SERVICE AREA AND HAS CONCLUDED THAT ONLY A HANDSET-BASED SOLUTION WOULD MEET THE PHASE II LOCATION REQUIREMENTS

Upon careful evaluation of several network-based and handset-based Phase II solutions, the Company has concluded that handset-based solutions are the only viable means of providing Phase II E911 service throughout Western's rural service areas. A GPS receiver is incorporated into the handset to determine the location of a mobile customer and is capable of locating a caller even in areas served by one cell site (no need to triangulate between multiple cell sites as required by a network-based solution to accurately determine the location of a customer). As previously stated, the vast majority of Western's service area is served by a single cell site.

A. Western Has Been Diligently Working To Implement A Phase II Solution That Meets The Commission's Requirements

Western has been diligently working for several years on potential solutions to the Commission's E911 Phase II requirements. In particular, soon after the Commission adopted its E911 rules, Western became one of the first CMRS carriers to participate in a lengthy technical trial of a Phase II location solution. Over the last few years, Western

⁴ In both network-based and handset-based solutions, the location server is referred to as the Position Determination Entity (PDE). In a network-based solution, the PDE will calculate the position of a wireless handset by using the Time Delay of Arrival (TDOA) measurements and/or the Angle of Arrival (AOA) measurements of the receivers that can capture the mobile's signal. The handset-based PDE combines a terrain database, handset GPS data, Round Trip Delay (RTD) measurements, and Pilot Signal Strength Measurements (PSSM) to calculate the mobile's position. The last component of the E911 Phase II location service is the Mobile Positioning Center (MPC). The MPC manages the data that must flow to the PSAP. The MPC routes the cell site identity, cell sector identity, and mobile dialed number to the PSAP similar to the E911 Phase I structure. In addition to this role, the MPC passes the processed location data from the PDE to the correct PSAP as the 911 call is processed. The MPC also processes a PSAP's request for updated location data by forwarding this request to the PDE which then extracts the updated data from the mobile.

also evaluated the technical, operational, and economic viability of several different E911 Phase II solutions, as well as numerous experimental location concepts not yet in full commercial development.

At the time the Commission adopted its Phase II rules, the technology did not exist to meet the location accuracy requirements specified in the rules. While some vendors claimed that they could produce the technology capable of meeting the Phase II location requirements, there were no commercially available solutions that could be validated through real-world testing. The Commission nonetheless determined, however, that the technology either existed (as certain vendors claimed) or could be developed in time to meet the five-year Phase II implementation schedule.⁵

Shortly after adoption of these rules, Western began working with both handset-based and network-based location technology vendors in an effort to identify a compliant Phase II solution. To serve its rural customers, Western has uniformly deployed an analog air interface (*e.g.*, AMPS technology). Because handset-based solutions do not exist for analog air interfaces, Western initially believed that its only available option was a network-based solution. Earlier this year, however, Western began its digital migration to code division multiple access (“CDMA”). As discussed below, based on the results of the trials of network-based solutions that the Company participated in, along with other

⁵ To the extent there is no solution that can be deployed pursuant to the deadlines set forth in Section 20.18 and with the accuracy required by this rule, it could be argued that the rule has no valid basis – the technology did not develop as the Commission initially envisioned. *See, e.g., Bechtel v. FCC*, 957 F.2d 873, 881 (D.C. Cir. 1992), *cert. denied*, 506 U.S. 816 (1992); *Geller v. FCC*, 610 F.2d 973, 980 (D.C. Cir. 1979); *Alltel Corp. v. FCC*, 838 F.2d 551, 561-62 (D.C. Cir. 1988); *Alenco Communications, Inc. v. FCC*, 201 F.3d 608 (5th Cir. 2000). Even if the rule’s basis remained valid, the rule would still be unenforceable because it is impossible to satisfy. *See Alliance for Cannabis Therapeutics v. DEA*, 930 F.2d 936 (D.C. Cir. 1991); *Ensuring Compatibility with Enhanced 911 Emergency Calling Systems: Hearing Before the House Subcomm. on Telecommunications and the Internet of the House Comm. on Energy and Commerce*, 107th Cong. (2000) (statement of Steve Clark, Vice President of Network Operations, United States Cellular Corporation). Western does not wish to challenge the Phase II rule, but rather to obtain a waiver that would authorize it to deploy a fully-compliant Phase II solution as soon as it becomes available.

publicly available information regarding similar tests conducted by other carriers, Western has concluded that a network-based solution is not viable for Western's rural service area and that a handset-based solution works best for its CDMA customers.

B. Western Participated In Technical Trials Of Network-Based Solutions And Concluded That A Network-Based Solution Is Not Viable For Its Uniquely Rural Service Area

In September 1997, Western commenced a technical trial of a network-based solution proposed by US Wireless. After two and one-half years, the data conclusively proved that a network-based solution would not allow Western to meet the Commission's Phase II accuracy requirements throughout its rural service area.⁶

In this trial, the Company installed US Wireless' location technology, called Radio Camera, within its cellular network in Montana. The Radio Camera system performed well in the central Billings, Montana area where 5 cell sites provide overlapping coverage, but in other areas where only one cell site provides coverage, the system was unable to improve upon Phase I location accuracy. Because Western's customers are largely served by only one cell site, the Radio Camera solution was eliminated from consideration. A summary of the test results, along with the final report from the trial, is attached hereto as Attachment B.

To validate and confirm that network-based solutions would not provide the required accuracy in its rural service areas, Western participated in the testing of another vendor's network-based solution (e.g., Cell-Loc Inc.) in February 2001. Western provided the vendor with cell site engineering data for its Pueblo, Colorado cellular

⁶ On June 28, 1999, Western participated in an E-911 Automatic Location Identification Round Table at the FCC. During this meeting, much of the discussion of the participants, including FCC staff, wireless carriers, location solution providers and other vendors, revolved around location technology testing and technology availability. Western addressed the challenges of locating wireless callers in a rural environment.

system, which was selected because it contained both urban and rural areas. Tests confirmed Western's prior findings that, although network-based technologies may be capable of meeting the Commission's accuracy requirements in urban areas with high cell site concentration, these technologies cannot meet the accuracy requirements in Western's rural service areas because of the low-density of cell sites.⁷ Although Western has had additional discussions with other network-based technology vendors offering similar triangulation (TDOA/AOA) type solutions, including SigmaOne, Grayson Wireless, and TruePosition,⁸ each of the technologies offered by these vendors suffered from the same or similar accuracy shortcomings.

In sum, the location limitations discovered during the Billings trial appear to be symptomatic of all network-based solutions. For these reasons, and pursuant to the Commission's direction that carriers "employ a solution that comes as close as possible,"⁹ in terms of providing reasonably accurate location information as quickly as possible, Western has opted for an APGS handset-based solution.

⁷ Attached as Appendix C are the results of this study using TDOA and AOA technology. The vendor indicated that additional cell sites would be required to improve accuracy. The construction of additional cell sites, however, would result in cellular service not being economically viable in rural areas. Based upon the Pueblo test results, it is estimated that Western would need to construct an additional 1,000 cell sites throughout its rural service areas to make a network-based solution potentially viable. Clearly, at a cost of approximately \$500,000.00 per cell site, the construction of 1,000 additional cell sites would be cost prohibitive.

⁸ See *Ex Parte Comments of True Position, Inc.*, CC Docket No. 94-102, at 2 (July 23, 2001) (indicating that its network-based technology did not produce required accuracy in rural areas).

⁹ *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, CC Docket No. 94-102, *Fourth Memorandum Opinion and Order*, 15 F.C.C.R. 17442, 17458 ¶ 45 (2000) ("*Fourth MO&O*").

IV. A LIMITED WAIVER OF THE COMMISSION'S PHASE II E911 REQUIREMENTS IS JUSTIFIED BASED UPON THE UNIQUE CIRCUMSTANCES FACED BY WESTERN

A. Western Meets The Requirements For Obtaining A Limited Waiver Of The Commission's Phase II Implementation Requirements

Under administrative law, "agency discretion to proceed in difficult areas through general rules is intimately linked to the existence of a safety valve procedure for consideration of an application for exemption based on special circumstances."¹⁰ Agencies generally use waivers as the safety valve procedure and courts require agencies to give waiver requests a "hard look."¹¹

The Commission's waiver standard is set forth in Sections 1.3 and 1.925 of its rules. Under these sections, and the case law interpreting them,¹² waivers of the Commission's rules generally will be granted if the underlying purpose of the rule would not be served by strict enforcement and grant is in the public interest, or there are unique or unusual factual circumstances that render application of the rule unduly burdensome, inequitable, or contrary to the public interest. Although not set forth in these codified waiver standards, the Commission has indicated that waivers of its Phase II E911 rules should be "specific, focused and limited" and demonstrate a "clear path to full compliance."¹³ As demonstrated below, Western has satisfied this requirement and should be granted a waiver that would permit it to deploy a handset-based Phase II E911 solution within the time period identified below.

¹⁰ *WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969), *cert. denied*, 409 U.S. 1027 (1972).

¹¹ *WAIT Radio*, 418 F.2d at 1157.

¹² *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990), *citing WAIT Radio*, 418 F.2d at 1159.

¹³ *Fourth MO&O*, 15 F.C.C.R. at 17458.

B. A Phase II E911 Handset-Based Solution Will Not Be Commercially Available To Western To Meet The Implementation Time Periods Established In Section 20.18 Of The Commission's Rules

Western believes that the best solution for meeting the Commission's Phase II requirements is the deployment of a handset-based location technology. Western is committed to a solution that best meets the Commission's Phase II location requirements, but must seek a limited waiver of the established time periods for deployment. The handset-based solution involves equipping mobile phone handsets with a GPS component capable of communicating with orbiting satellites to determine location information. AGPS uses additional information, provided by the wireless system, to reduce location time and improve accuracy in areas of poor satellite coverage. AGPS works well in all environments, including in rural areas. AGPS also has emerged as the location technology standard for CDMA carriers like Western because the technology satisfies the Commission's accuracy requirements and provides more accurate information than any other location technology on rural CDMA networks.¹⁴

Although AGPS has emerged as the best technology for CDMA carriers deploying Phase II E911 service,¹⁵ commercial products are just now coming to fruition and will not be commercially available to meet the Phase II deployment time periods. The AGPS solution requires GPS capability in the handset, new software in the switch to allow the location information to be passed from the cell site to the switch, and requires the installation and testing of the MPC and PDE.

¹⁴ See *Inland Cellular Telephone Co. Petition for Limited Waiver of Sections 20.18(e) and (g) of the Rules*, CC Docket No. 94-102 (July 31, 2001) ("Inland Waiver"); *Qwest Wireless, LLC and TW Wireless, LLC Petition For Extension of Time or Waiver of Section 20.18 of the Rules*, CC Docket 94-102 (July 23, 2001) ("Qwest Waiver"); *Verizon Wireless, Updated Phase II E911 Report and Request for Limited Waiver*, CC Docket No. 94-102 ("Verizon Waiver") (July 25, 2001); *Sprint PCS Supplemental Phase II Implementation Report and Request for Temporary and Limited Waiver*, CC Docket No. 94-102 (July 30, 2001) ("Sprint Waiver").

¹⁵ See Qwest Waiver at 4.

C. A Limited Waiver Of Section 20.18(g)(1) Is Warranted Because The Technology Necessary To Meet The Commission's Phase II E911 Requirements Will Not Be Commercially Available On October 1, 2001

Section 20.18(g)(1) sets forth implementation time periods for the deployment of Phase II compliant handsets. It has become apparent that, based upon discussions with equipment vendors and as demonstrated by other CDMA-based carriers, the deployment time periods established under the Commission's rules cannot be met.¹⁶ Accordingly, Western seeks a limited waiver of Section 20.18(g)(1) to align deployment with the commercial availability of Phase II handset-based location technology and Western's ability to fully implement this technology into its markets.

Western seeks a waiver of Section 20.18(g)(1) to deploy Phase II E911 compliant handsets according to the following schedule:

- | | |
|--|-------|
| • Handset Sales Commence | 4/02 |
| • 50% of Handset Sales are AGPS | 6/03 |
| • 100% of Digital Handset Sales are AGPS ¹⁷ | 4/04 |
| • 95% of the Entire Customer Base is AGPS | 12/05 |

1. Handset Sales

With respect to the deployment of compliant handsets, several major handset vendors have indicated that the necessary CDMA handsets would become available in early 2002.¹⁸ Western does not have the clout to dictate the production schedule of new handsets with GPS capability. The Company traditionally receives new handset models after the larger carriers, who are able to exert greater influence over vendor production

¹⁶ See Qwest Waiver at 18-20; Verizon Waiver at 13-14, 18-20; Inland Waiver at 7.

¹⁷ All of Western's handset sales will be location-enabled as of this date, with the exception of a small percentage of 3-watt analog phones.

¹⁸ See Attachment D: Letters from Nokia and Motorola.

schedules than smaller carriers.¹⁹ This lag time for new handset models is typically 90 days.²⁰

Even if GPS handsets were available today, the handset-based Phase II solution would not work until switch upgrades are in place and working. Lucent has indicated that the software and hardware necessary to deploy AGPS/AFLT – the switch upgrade necessary to support a handset-based solution – will not be available until November 2001; Nortel has indicated that the necessary upgrades to support AGPS/AFLT will not be available until Q2 2002.²¹ Obtaining and installing the required software and equipment will be a complicated and difficult task. National and regional carriers alike face these same equipment availability and implementation challenges. Western anticipates that it will take at least six weeks to complete the necessary switch modifications once they become commercially available because Western must schedule delivery of the equipment, install the equipment, thoroughly test the equipment, and then implement the upgrades into its network. Adding new elements into an existing wireless network is never an easy or quick task and a carrier must proceed cautiously or risk service interruption to its entire customer base.

From discussions with various handset vendors, Western believes new GPS phones will not be available initially from all handset vendors, and those GPS handsets that are available will be priced significantly higher than regular (non-GPS) phones. Many customers are very sensitive to the price of the phone and regardless of the additional safety features associated with GPS phones, Western expects that many customers will choose lower priced non-GPS phones. As GPS handset prices drop in the

¹⁹ See Inland Waiver at 2-6, 8-9; *accord* Qwest Waiver at 6.

²⁰ See Attachment E: Affidavit of Richard Hecht, Western's Executive Director of Sales and Distribution.

²¹ See Attachment F: Letters from Nortel and Lucent.

market, more customers are likely to choose them. Today, Western's customers have the option of choosing many different types of handsets to serve their needs. Consequently, many of Western's customers use a wide variety of handsets to access its network. These handsets and customer rate plans are purchased from both Company-owned stores, various distribution outlets, and resellers. Each type of handset has different features associated with it, and other handsets, like 3-watt analog phones, provide users with extended calling areas. Many additional factors such as price, weight, and style come into play when a customer chooses a phone. Western has a limited ability to influence the choice of phones that customers use on its network. The Company, however, always strives to present to its customers with a broad range of phones from which to choose.

Consequently, Western believes that immediate wide-scale deployment of GPS phones upon commercial availability is not possible, and, indeed, imprudent, until GPS phones are no longer priced as a premium product by manufacturers and are widely available in handsets used by consumers. The proposed date of April 2002 to begin selling Phase II compliant handsets, June 2003 for 50% of new handset sales being Phase II compliant, and April 2004 for 100% of new handset sales being Phase II compliant, takes into consideration these limitations.

2. Conversion of Embedded Base

Western plans to fully comply with the requirement to convert 100 % of its embedded base to location-enabled handsets by December 31, 2005 with one limited exception – a small percentage of 3-watt analog phones will continue to be sold. Given the rural nature of Western's service area and distances between cell sites, many customers have chosen 3-watt analog phones as their primary mobile phone for use on Western's network. In some remote areas within Western's markets, only 3-watt phones

are able to receive service. Many of our 3-watt analog customers have been reluctant to migrate to newer (lower powered) digital phones with enhanced services because the change may mean giving up service in some areas. Thus, Western has a customer base who prefer 3-watt analog phones -- approximately 8-10% of its customers.²² Many of these customers are not expected to purchase lower powered digital phones in the near future. For this reason, the Company believes that it will always have 3-watt analog phones in use on its network.

Western is not aware of any manufacturer that is planning to develop and produce CDMA 3-watt phones with GPS capability. Thus, 3-watt phones will not be capable of supplying Phase II information. Accordingly, Western will not in the foreseeable future have its entire customer base using GPS-enabled CDMA handsets.²³

D. Grant Of The Limited Waiver Requested By Western Would Serve The Public Interest

Western is committed to providing the most precise location information possible to PSAPs. To this end, and prior to the complete deployment of a handset-based solution, Western will implement available location technology into its network capable of providing location information that is superior to Phase I information. Specifically, the Company will take this initial step towards Phase II compliance using MPC/PDE technology as a first step in Phase II deployment.²⁴

Deploying a MPC/PDE as a transitional step towards wide scale deployment of a handset-based solution will allow Western to improve location information associated with non-GPS CDMA handsets. This solution has been identified as EFLT (Enhanced

²² See Attachment E: Affidavit of Rich Hecht, Western's Director of Distribution.

²³ Western notes that the Commission's rules currently require it to meet demand for analog services. See 47 C.F.R. § 22.933.

²⁴ Verizon Waiver at 9-10, 25-26; Qwest Waiver at 12, 16, 22-25; Sprint Waiver at 7-8, 13-14.

Forward Link Triangulation) by other carriers. As Verizon has noted: “Preliminary tests showed that EFLT performed robustly in nearly all scenarios. For stationary mobiles, the mean accuracy in RMS was approximately 250 meters, with 10 point averaging, and approximately 300 meters without averaging. For moving mobiles, it averaged 300-350 meter accuracy.”²⁵

Lucent, one of the Company’s equipment vendors, has indicated a November 2001 availability for EFLT supporting software, and Nortel, its other equipment vendor, has indicated Q2 2002 availability for this software.²⁶ Although Western believes that EFLT will have the same limitations as other network-based solutions in rural areas, it will deploy the technology as a transitional step towards Phase II implementation.²⁷ Moreover, EFLT will provide a “safety-net” for callers that do not have location-enabled handsets.

Western’s proposed E911 Phase II deployment schedule will improve location services for the public and its subscribers. First, by deploying the transitional EFLT solution, Western will ensure that subscribers without AGPS phones will have access to location information with accuracy better than Phase I information. The EFLT solution provides more accurate information than that of standard Phase I service. Moreover, the network upgrades necessary to implement an EFLT solution will ultimately allow Western to speed up its final, full Phase II AGPS solution.

²⁵ Verizon Waiver at 12.

²⁶ See Attachment F.

²⁷ The transitional step of deploying EFLT is a necessary step in implementing the ultimate handset-based solution. Western’s approach to deploying EFLT prior to full handset-based implementation is an attempt to provide the most precise location information possible to PSAPs during the evolution to a fully compliant Phase II handset-based solution.

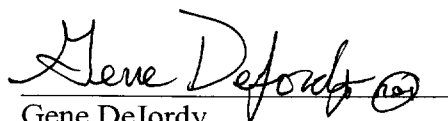
Western is committed to deploying the most accurate location technology – AGPS/AFLT – for its CDMA subscribers. The deployment schedule by Western is appropriate given the rural nature of its markets and the relatively small number of PSAPs that have requested Phase II from the Company. The proposed deployment plan and limited waiver allows Western to meet the customers wireless E911 needs in the most thorough, timely, efficient and effective manner possible given the unique challenges of the rural environment where Western provides service. This plan takes into account the PSAP's immediate need for enhanced 911 services and also considers the handset and network components availability to a smaller, regional carrier.

CONCLUSION

For the foregoing reasons, there is good cause to grant the instant limited waiver. Western's request is specific, limited in scope, and demonstrates a path to full compliance with the Phase II rules.

Respectfully submitted.

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August 31, 2001

ATTACHMENT A

COMPANIES COVERED BY WESTERN WIRELESS CORPORATION WAIVER REQUEST

Carrier Name

WWC Holding Co., Inc.

WWC License L.L.C.

WWC Texas RSA, L.P.

TRS Numbers

808809

805958

817878

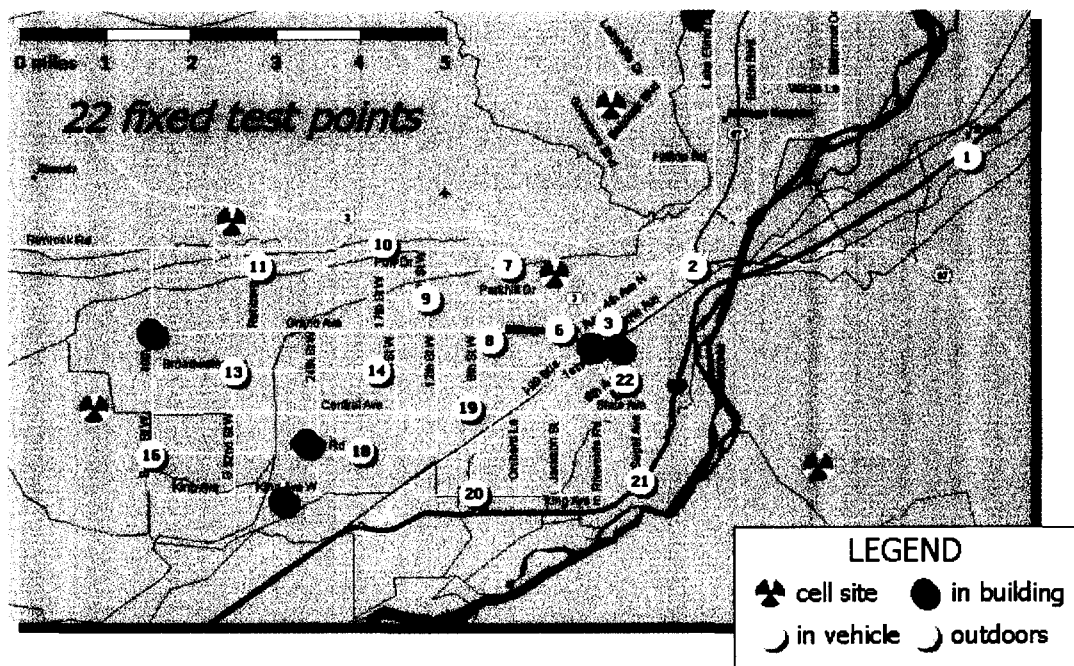
ATTACHMENT B

US Wireless Trial

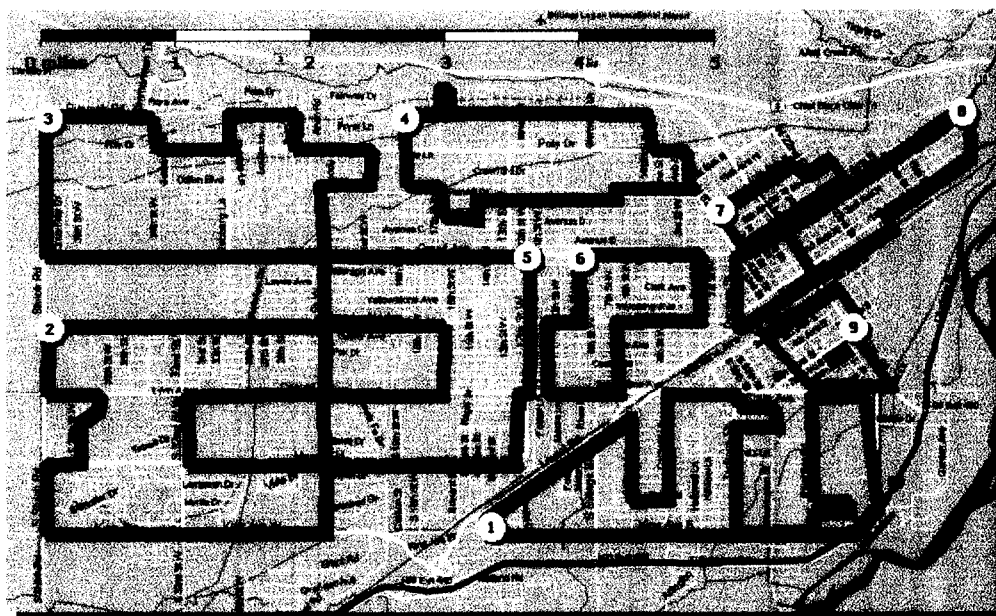
In September 1997, Western agreed to assist US Wireless Corp. ("US Wireless") in field-testing its Phase II location technology in Billings, Montana. Specifically, Western allowed US Wireless to install its technology on a portion of Western's network covering Billings. In addition to Western and US Wireless, the following parties also participated in the trial:

- State of Montana
- U S WEST Communications, Inc. (now Qwest)
- Nortel Networks
- XY Point Corporation
- Williams Communications Solutions
- Combix 9-1-1 Specialists
- ISD Information Services Division
- Billings 9-1-1 Center

The coverage area selected for the test encompassed approximately 25 square miles, including downtown Billings and the surrounding industrial and suburban regions. A total of 22 fixed test points and 9 mobile test routes were selected for evaluation. The points were chosen to uniformly sample the test area and are identified in the following maps.



- Fixed test points.



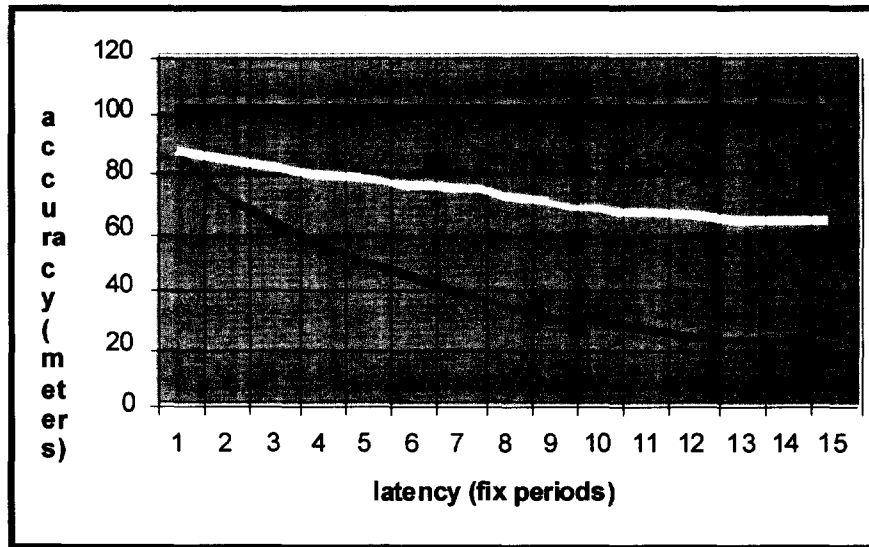
- Mobile test routes.

For purposes of evaluation and comparison, the test points and mobile routes were divided into four environments: (1) light urban; (2) industrial; (3) residential; and (4) suburban. After evaluating the performance of US Wireless' technology in these

environments, Western concluded that the technology might be able to satisfy the FCC's accuracy requirements in urban and suburban areas where the coverage of cell sites overlapped significantly. These environments, however, represent only 3% of Western's service area.

Location accuracy is reported as a function of latency. As with most location systems, accuracy can be substantially improved if longer observation periods are permitted. By using a quality (confidence) measure, the system can determine which of the fixes measured during a given observation period is best, and report only that location.

Thousands of calls were processed during this trial. The observation period was ranged from 1 fix period (approximately 3 seconds) up to 15 fix periods (approximately 45 seconds). This analysis was performed for each of the four test environments mentioned above, as well as for the combined environments. The results of the combined test are shown in the following chart, where the 67th percentile accuracy vs. latency performance is shown. The white curve shows the performance achieved by the location fix with the highest quality factor. The dark gray curve shows the optimal performance achieved by choosing the best location estimate in the observation interval, regardless of the confidence factor. This curve represents the type of performance that might be achieved if the quality factor estimation was completely optimized. In this early trial, typical location accuracy was less than 80 meters with twelve-second latency.



- Combined environments, Stage III.

A full report describing the trial is appended hereto.

Performance in Rural Billings, Montana

During the Billings trial, tests also were conducted outside of the 25 square mile downtown area to estimate the performance of the Phase II system in rural conditions (low cell site density). The results of this trial conclusively proved that a network-based solution cannot provide the accuracy mandated by the FCC in rural areas. These rural areas comprise roughly 97% of Western's coverage area -- almost 880,000 square miles -- and are served by cells with very large coverage areas. Very few of these cells produce coverage areas that overlap with the coverage provided by another cell. The average coverage area per site is 830 square miles. In the urbanized pockets of Western's service area, the average coverage per cell is 87 square miles. These factors make it virtually impossible for a network-based technology to provide accurate location information. Large cell coverage areas make location calculation nearly impossible due to the need to calibrate vast areas of land that have no paved roads. Additionally, minimal overlapping